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the bars *ee* to diverge, and thereby will throw out the arms *dd* to the positions marked by the dotted lines, when they will hitch on two opposite teeth of the rack, and prevent the weight from falling any lower.

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No. IV.

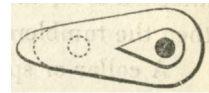
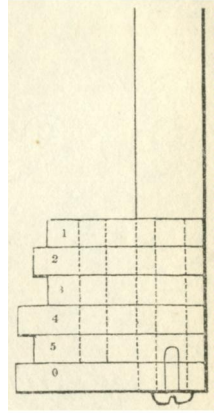
PERMUTATION LOCK.

*The SILVER ISIS MEDAL was voted to Mr. A. MACKINNON of Sheffield, for his Permutation Lock; one of which has been placed in the Society's Repository.*

THE general principles of those locks, which, like Barron's, depend for their security on a series of tumblers, which are raised to different heights by means of irregular steps, or notches in the key, are too well known to need description.

The object of the present invention is two-fold,—to enable any person to change at will the *pattern* or arrangement of the movable parts in his lock and key, or to keep his key, except when actually in use, in such a state as to render it unavailing to any one but himself.

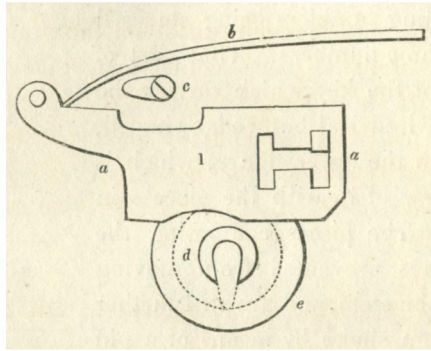
The bit of the key is composed of one piece, marked *o* in the annexed figure, which acts on the bolt, and of as many other pieces, 1, 2, 3, 4, 5, as there are tumblers in the lock; the pieces of the bit and their corresponding tumblers being stamped with the same numbers. That part of the stem of the key which carries the bit is not cylindrical but wedge-shaped, as shewn in the lower figure, which is an end view of it, with the piece *o* in its place. The pieces composing the bit are thus prevented from moving round on the stem, and are still further secured from shake by means of a pin fixed to the under side of *o*, as shewn by the dotted circle in the lower figure, and which passes through the tumbler-bits 5 to 1. The piece *o* is fixed in its place by a small screw.



It is almost needless to remark, that if the owner changes the order of the pieces composing the bit, he must change also, in exact correspondence, the order of the tumblers within the lock. It may sometimes be advisable to do this, when suspicion exists that a copy of the key has been obtained; and it might also in some circumstances be desirable to keep the key with its parts purposely misplaced, in order to foil any surreptitious attempts to open the lock even with its own key.

In the subjoined figure, which represents part of the lock, *aa* is the tumbler No. 1. *b* is an edge-view of a broad spring which acts on all the tumblers at once, depressing them after the four-sided stud of the bolt has passed, by the action of the key, from one notch in the

tumbler to the other. It is evident that the relative position of the tumblers cannot be conveniently changed so long as this strong spring continues to act on them: but,



by applying a turncrew at *c*, and thus raising the button attached to it, the pressure of the spring is relieved, and then the tumblers may be displaced without any difficulty.

A collar or split pipe *d* projects from a circular plate *e*, closely clipping the whole bit of the key, and turning round with it when in use: this prevents any of the pieces of which the bit is composed from being strained by any stiffness in the bolt or tumblers, or by any accidental obstruction.